1. (Currently amended) A method comprising:

providing a substrate into a processing tool;

forming a barrier layer on the substrate;

forming a metal seed layer over the barrier layer; ~~and~~

forming a passivation layer over the metal seed layer while in the processing tool by exposing the substrate having the metal seed layer and the barrier layer to a gas for a first specified period of time, and cooling the gas at a specified temperature for a second specified period of time~~.~~ ;

providing the substrate with the barrier layer, metal seed layer and the passivation layer into a contamination removal chamber of a plating tool;

annealing the substrate within the plating tool; and

depositing a conductive material at least in a trench and a via patterned on the substrate structure within the plating tool.

2. (previously presented) The method of claim 1 wherein forming the passivation layer comprises forming a passivation layer in a gas environment selected from the group consisting of inert gases, hydrogen gas, fluorine containing gas, forming gas, oxygen gas and nitrogen gas.

3. (previously presented) The method of claim 1 wherein forming the passivation layer comprises forming a passivation layer using a liquid selected from the group consisting of acids, bases, solvents and di-ionized water.

4. (Previously presented) The method of claim 2 wherein forming the passivation layer comprises forming a passivation layer in an oxygen gas environment to form a metal oxide layer on the metal seed layer.

5. (Original) The method of claim 1 wherein the metal seed layer is selected from the group consisting of copper, copper alloy, nickel, silver, gold and cobalt.

6. (Original) The method of claim 1 wherein the barrier layer is selected from the group consisting of tantalum, tantalum nitride, titanium, titanium nitride, tungsten nitride, tungsten-tantalum and tantalum silicon nitride.

7. (Previously presented) The method of claim 1 wherein the processing tool is a metal-barrier deposition tool.

8. (Canceled)

9. (Previously presented) The method of claim 1 wherein the first specified period of time is in a range of approximately 15-25 seconds.

10. (Previously presented) The method of claim 1 wherein the second specified period of time is in a range of approximately 5-15 seconds.

11. (Previously presented) The method of claim 1 wherein the specified temperature is about 15-20° C.

12. (Previously presented) The method of claim 1 wherein the gas comprises oxygen gas at a pressure of up to 2 torr.

13. (Canceled)

14. (Currently amended) The method of claim ~~13~~ 1 further comprising annealing the substrate with the barrier layer, metal seed layer and the passivation layer in forming gas to remove the passivation layer.

15. (previously presented) The method of claim 14 wherein annealing comprises flowing forming gas into an anneal chamber for a first specified period of time at a seed anneal cooling temperature of about 250 ° C.

16. (Previously presented) The method of claim 15 further comprising cooling the annealed substrate in forming gas for a second specified period of time at a seed anneal cooling temperature of about 15-20 ° C.

17. (Previously presented) The method of claim 15 wherein the first specified period of time is about 30 seconds.

18. (Previously presented) The method of claim 16 wherein the second specified period of time is about 25 seconds.

19. (Original) The method of claim 14 wherein the forming gas comprises about 95 percent nitrogen and 5 percent hydrogen.

20. (Previously presented) The method of claim 14 further comprising depositing a conductive material at least in a trench and a via patterned on the substrate structure using electrolytic plating.

21. (Original) The method of claim 20 wherein the conductive material is selected from the group consisting of copper, silver and gold.

22. (Previously presented) A method comprising:

providing a substrate into a plating tool, the substrate having at least a trench and at least a via patterned thereon, a barrier layer formed in the trench and the via, a metal seed layer formed on the barrier layer and a passivation layer formed on the metal seed layer, wherein the metal seed layer and the passivation layer are formed substantially sequentially within a same processing tool;

annealing the substrate in forming gas to remove the passivation layer; and

depositing a conductive material at least inside the trench and the via of the substrate using a plating process selected from the group consisting of electrolytic plating and electroless plating wherein the annealing and depositing are performed substantially sequentially for each substrate in a substrate batch under vacuum conditions within the plating tool.

23. (Canceled)

24. (Previously presented) The method of claim 22 wherein annealing comprises flowing forming gas into a contamination removal chamber of the plating tool for a first specified period of time at a seed anneal temperature of about 250 ° C.

25. (Previously presented) The method of claim 24 further comprising cooling the annealed substrate in forming gas for a second specified period of time at a temperature of about 15-20 ° C.

26. (Previously presented) The method of claim 24 wherein the first specified period of time is about 30 seconds.

27. (Previously presented) The method of claim 25 wherein the second specified period of time is about 25 seconds.

28. (Currently amended) A system comprising:

at least one seed anneal chamber to perform seed anneal of a substrate, the substrate having at least a trench and a via patterned thereon, a barrier layer formed in the trench and the via, a metal seed layer formed on the barrier layer, and a seed passivation layer formed on the metal seed layer, wherein the metal seed layer and the seed passivation layer are formed substantially sequentially within a same processing tool;

a gas delivery system coupled to the at least one seed anneal chamber to introduce a forming gas into the contamination removal chamber to remove the seed passivation layer; and

at least one plating chamber coupled to the at least one seed anneal chamber and to the gas delivery system, the at least one plating chamber for depositing a conductive material at least inside the trench and the via of the substrate using a plating process selected from the group consisting of electrolytic plating and electroless plating. ,wherein the seed anneal chamber and the plating chamber comprise a plating tool.

29. (Currently amended) The system of claim 28 wherein performing seed anneal and depositing a conductive material are performed substantially sequentially for each substrate batch under vacuum conditions within a the plating tool.

30. (Previously presented) The system of claim 28 wherein the gas delivery system introduces into the seed anneal chamber hot forming gas at a temperature of about 250° C for about 30 seconds followed by cool forming gas at a temperature of about 20° C for about 25 seconds.